

Complete Summary

GUIDELINE TITLE

The diagnosis and treatment of heel pain.

BIBLIOGRAPHIC SOURCE(S)

The diagnosis and treatment of heel pain. J Foot Ankle Surg 2001 Sep-Oct; 40(5): 329-40. [158 references]

COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis

RECOMMENDATIONS

EVIDENCE SUPPORTING THE RECOMMENDATIONS

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Heel pain

GUIDELINE CATEGORY

Diagnosis

Treatment

CLINICAL SPECIALTY

Family Practice

Internal Medicine

Podiatry

INTENDED USERS

Physicians

Podiatrists

GUIDELINE OBJECTIVE(S)

To provide recommendations for the diagnosis and treatment of heel pain

TARGET POPULATION

Individuals with heel pain

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. History and physical examination
2. Radiographs
3. Electromyography (EMG)
4. Nerve conduction velocity (NCV)
5. Magnetic resonance imaging (MRI)
6. Scintigraphy, technetium-99 bone scans
7. Rheumatologic consultation

Treatment

1. Nonsteroidal anti-inflammatory drugs
2. Padding and strapping of the foot
3. Corticosteroid injections
4. Patient-directed treatments, such as regular stretching, and other physical therapy, avoidance of flat shoes and barefoot walking, use of open-back shoes, use of cryotherapy directly to the affected part, over-the-counter arch supports and heel cushions, and limitation of extended physical activity
5. Weight loss, if appropriate
6. Continuation of initial treatment options above, with consideration of additional therapy including custom orthotic devices, Cam walkers, night splints, corticosteroid injections, and cast immobilization.
7. Surgical interventions including plantar fasciotomy, removal of heel spur, and calcaneal osteotomy
8. Extracorporeal shock wave therapy
9. Referral to podiatric foot and ankle surgeon

MAJOR OUTCOMES CONSIDERED

- Causative factors of heel pain
- Prevalence of heel pain
- Clinical response to treatment
- Resolution of symptoms

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Committee)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Decision Analysis
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The recommendations for the diagnosis and treatment of heel pain are presented in the form of an algorithm with accompanying annotations. Algorithms are provided for [Heel Pain](#), [Mechanical Plantar Heel Pain](#), [Mechanical Posterior Heel Pain](#), and [Differential Diagnosis of Heel Pain](#). Annotations follow.

[Heel Pain \(Pathway 1\)](#)

Mechanical factors are the most common etiology of heel pain. Other causes include traumatic, neurologic, arthritic, infectious, neoplastic, autoimmune, and other systemic conditions. Diagnostic testing and treatment must be directed at the correct causative factors.

[Mechanical Plantar Heel Pain \(Pathway 2\)](#)

Mechanical heel pain is one of the most frequent conditions presented to foot and ankle specialists. Plantar heel pain is responsible for the majority of mechanical heel pain cases. Plantar heel pain is defined as insertional heel pain of the plantar fascia with or without a heel spur.

The most common cause cited for plantar heel pain is biomechanical abnormalities that lead to pathologic stress to the plantar soft tissues. Localized nerve entrapment of the medial calcaneal or muscular branch off the lateral plantar nerve may be a contributing factor.

Patients usually present with isolated plantar heel pain upon initiation of weightbearing, either in the morning upon rising or after sitting for a period of rest. The pain tends to decrease after a few minutes, then returns as the day proceeds and time on the feet increases. Associated significant findings may include high body mass index, tightness of the Achilles tendon, pain upon palpation of the inferior heel, and inappropriate shoe wear.

Many patients will have attempted self-remedies before seeking medical advice. A careful history is important, including time(s) of day when pain occurs, current shoe wear, activity level, both at work and at leisure, and history of trauma. An appropriate physical examination of the lower extremity includes range of motion of the ankle with special attention to decreased range of motion of dorsiflexion of the ankle, palpation of the inferior medial aspect of the heel, the occurrence of bilateral symptoms, and angle and base of gait evaluation.

Following physical examination, appropriate radiographs may be considered. Radiographic identification of a plantar heel spur indicates that the condition has been present for at least 6 to 12 months, whether having been symptomatic or not. As a rule, the longer the duration of heel pain symptoms, the longer the period to final resolution of the condition.

Initial treatment options may include nonsteroidal anti-inflammatory drugs (NSAIDs), padding and strapping of the foot, and corticosteroid injections for

appropriate patients. Patient-directed treatments seem to be as important in resolving symptoms. They include regular stretching of the calf muscles, avoidance of flat shoes and barefoot walking, use of cryotherapy directly to the affected part, over-the-counter arch supports and heel cushions, and limitation of extended physical activities.

Patients usually have a clinical response within 6 weeks of initiation of treatment. If improvement is noted, the initial therapy program is continued until symptoms are resolved. If no improvement is noted, the patient should be referred to a podiatric foot and ankle surgeon.

The second phase of treatment for the referred patient includes continuation of the initial treatment options with considerations for additional therapy: the use of custom orthotic devices, especially in the biomechanically malaligned patient, the use of night splints to maintain an extended length of the plantar fascia during sleep, a limited number of corticosteroid injections, and cast immobilization for 4 to 6 weeks or the use of a fixed ankle walker-type device to immobilize the foot during activity.

In patients with a high body mass index, a consultation and referral for an appropriate weight-loss program should be considered. Clinical response to this second phase of treatment will usually occur within 2 to 3 months in 85% to 90% of patients. For those who have shown improvement, phase 1 and phase 2 therapy should be considered until resolution of symptoms. When no improvement is noted, other systemic diseases should be considered.

The third phase of treatment continues phase 1 and/or 2 programs with the addition of cast immobilization in patients who may not have undergone that treatment in phase 1 or 2. Treatments that may be considered at this time include surgical plantar fasciotomy using a recognized technique and extracorporeal shock wave therapy has shown promise. In the majority of cases, removal of the plantar spur does not seem to add to the success of the outcome in the surgical treatment of plantar heel pain.

Following a therapeutic regimen as outline in the pathways, 90% to 95% of patients will experience resolution of symptoms within 1 year. A subset of patients will have continued problems; additional research is needed to allow these patients to achieve symptom resolution.

[Mechanical Posterior Heel Pain \(Pathway 3\)](#)

The posterior heel is the second most common location of mechanically induced symptoms. Pathology is categorized as (1) insertional Achilles tendonitis, and (2) bursitis often associated with Haglund's deformity ("pump bumps").

Insertional Achilles tendonitis most commonly presents with an insidious onset often leading to chronic posterior heel pain and swelling. Pain is aggravated by increased activity (e.g., walking and/or running), and pressure caused by shoe gear. A palpable prominence may be appreciated both medially and laterally to the insertion of the Achilles tendon. Tenderness can be central or more globally located posteriorly on physical examination. Radiographic findings commonly show insertional spurring or erosion.

Initial treatment centers around reducing pressure to the area (e.g., open-backed shoes), heel lifts/orthotics, nonsteroidal anti-inflammatory drug therapy, and various physical therapy modalities, including stretching. Primary treatment with immobilization may be considered in particularly acute cases, although this is more commonly used if the previously described treatments are unsuccessful. Local corticosteroid injections are not recommended.

Resistant cases should be referred to a podiatric foot and ankle surgeon. Surgery may be indicated (e.g., resection of the posterior spur along with pathologic soft tissue-inflamed bursa, diseased tendon). Various degrees of detachment with subsequent reattachment of the Achilles tendon may be needed to assure complete resection of the spur.

Bursitis associated with Haglund's deformity may occur in both sexes and at any age, although studies have shown that females aged 20 to 30 years are most commonly affected. Symptoms include acute pain and inflammation significantly aggravated by shoe gear. Pain is relieved by barefoot walking. On physical examination there is tenderness lateral to the Achilles tendon, usually associated with a palpable posterior lateral prominence. Radiographs commonly demonstrate prominence of the posterior surface of the calcaneus. The degree of prominence may be quantified by documenting specific radiographic angles.

Initial treatment, such as open-backed shoes, nonsteroidal anti-inflammatory drug therapy, injections (with care taken not to inject the Achilles tendon), is always directed toward eliminating pressure and inflammation to the symptomatic area. Physical therapy also may be helpful.

If symptoms are not improved after an adequate period of nonoperative treatment, the patient should be referred to a podiatric foot and ankle surgeon, and surgery may be required. Resection of the prominent posterior superior aspect of the calcaneus and inflamed bursa is the indicated surgical procedure. Although not commonly performed, calcaneal osteotomy may also be required to correct abnormal calcaneal alignment (e.g., calcaneal varus).

[Neurologic Heel Pain \(Pathway 4\)](#)

Neurologic heel pain is defined as pain in the heel as a result of entrapment or irritation of one or more of the nerves that innervate this region. The nerves specifically considered are:

- Posterior tibial (tarsal tunnel syndrome)
- Medial calcaneal (heel neuroma)
- Medial plantar
- Lateral plantar, including branch to abductor digiti minimi
- Sural, including lateral calcaneal

Neurologic pain in the heel or the absence of sensation in the foot and/or heel can also be due to more proximal nerve impingement syndromes. Patients describing pain that originates in the low back and radiates down the leg and into the foot must be assessed for radiculopathy secondary to proximal nerve root pathology.

If neurologic heel pain is suspected, appropriate referral for diagnostic studies and/or assessment by a specialist should be considered. Diagnostic studies may include:

- Electromyography
- Nerve conduction velocity
- Magnetic resonance imaging

After consultation reports and diagnostic studies are reviewed, accurate diagnosis and treatment protocol can be developed. In some instances, the podiatric foot and ankle surgeon will manage local conditions in the foot and ankle, while referral to appropriate specialists may be required if the pathology is found to be originating from the lumbar area.

The exact prevalence of heel pain secondary to neurologic causes in the general population is unknown. Obesity, venous insufficiency, trauma, and space-occupying lesions may be factors because they can put pressure on the involved nerve. Most causes of neurologic heel pain are unilateral. However, bilateral cases of entrapment neuropathy causing symptoms have been reported. In suspected neurologic heel pain, especially in bilateral presentations, an underlying systemic disease process must be ruled out.

Arthritides in Heel Pain (Pathway 4)

Most cases of heel pain encountered in clinical practice are likely to have a biomechanical etiology and respond to recommended therapy. In the process of taking a history and conducting a physical examination, a physician should consider that various systemic arthritides are also capable of presentation as heel pain. These include the seronegative arthritides, psoriatic arthritis, Reiter's disease, diffuse idiopathic skeletal hyperostosis, rheumatoid arthritis, fibromyalgia, and gout.

These patients may have other joint symptoms and should be questioned regarding concomitant arthralgias. This, in conjunction with careful radiologic evaluation and laboratory testing, may provide help in proper diagnosis and treatment of these unresponsive patients.

Occasionally, scintigraphy may be useful in diagnosis, as a pattern of joint involvement will be evidenced. Radiographs of the heel may show erosions or proliferative changes specific to one of these diseases. Rheumatologic consultation may be helpful for diagnosis and treatment.

Traumatic Heel Pain (Pathway 4)

Acute trauma to the calcaneus is the most common osseous cause of heel pain. In almost all cases, the mechanism of injury is a fall from a height onto the heel. Intra-articular fractures involving the subtalar joint result in diffuse pain in the rearfoot that is poorly localized to the heel itself. In less severe injuries, more focal symptoms are found corresponding to the anatomic area of the fracture. These include isolated injuries to the sustentaculum tali, the plantar calcaneal tubercles, and avulsion of the posterior aspect of the tuber. Diagnosis is made by

a history of trauma, focal pain on palpation, and radiologic confirmation of the fracture. Treatment is most often surgical when significant functional units are violated. In those cases where the fracture fragments are small, nonarticular, or minimally displaced, treatment is typically simple immobilization.

Stress fractures of the calcaneus occur as a consequence of repetitive load to the heel. The most common site of stress fracture is just posterior and inferior to the posterior facet of the subtalar joint. Although the exact mechanism is unknown, historically many patients report an antecedent increase in walking activity just prior to the onset of symptoms. The diagnosis should be entertained upon clinical suspicion and elicitation of such a history. The physical findings include tenderness to the lateral wall of the calcaneus, just posterior to the facet. There may be swelling and warmth. Pain elicited with compression of the calcaneus is highly suspicious of a stress fracture. Often the onset of symptoms precedes the radiographic findings and ancillary measures can assist in early diagnosis. Technetium bone scans are highly sensitive for stress fractures of the calcaneus in this setting. Radiographic features include an area of linear sclerosis corresponding to the fracture site. Treatment is conservative and involves protection and immobilization of the involved foot. Progression to an acute fracture is uncommon.

Soft-tissue trauma (e.g., acute plantar fascia rupture) can also cause heel pain and be present in patients with negative radiographic and bone-scan findings. Clinical examination and appropriate diagnostic imaging can lead to establishing a diagnosis and treatment plan.

[Other Causes of Heel Pain \(Pathway 4\)](#)

Although rare, conditions such as benign and malignant tumors, infection (soft tissue and bone), and vascular compromise must be considered as etiologies for a patient's heel pain. The potential morbidity of these conditions is substantial. Proper diagnostic testing along with consultation or referral to the appropriate specialist is paramount in these individuals. In adolescents, calcaneal apophysitis is probably the most frequent etiology of heel pain. Palliative treatment is successful in almost all cases.

CLINICAL ALGORITHM(S)

Algorithms are provided for [Heel Pain](#), [Mechanical Plantar Heel Pain](#), [Mechanical Posterior Heel Pain](#), and the [Differential Diagnosis of Heel Pain](#).

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate diagnosis and treatment of heel pain

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

The diagnosis and treatment of heel pain. J Foot Ankle Surg 2001 Sep-Oct; 40(5): 329-40. [158 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Sep-Oct

GUIDELINE DEVELOPER(S)

American College of Foot and Ankle Surgeons - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Foot and Ankle Surgeons

GUIDELINE COMMITTEE

Clinical Practice Guideline Heel Pain Panel

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: James L Thomas, DPM, Chair; Jeffrey C. Christensen, DPM, Board Liaison; Steven R. Kravitz, DPM; Robert W. Mendicino, DPM; John Schuberth, DPM; John V. Vanore, DPM; Lowell Scott Weil, DPM; Howard J. Zlotoff, DPM; and Susan D. Couture

2001 Clinical Practice Guideline Core Committee: James L. Thomas, DPM, FACFAS, Chair; Susan D. Couture, Vice Chair; David J. Caldarella, DPM, Board Liaison; Allen M. Jacobs, DPM; Michael S. Lee, DPM; Robert W. Mendicino, DPM; John M. Schuberth, DPM; and John V. Vanore, DPM

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [American College of Foot and Ankle Surgeons \(ACFAS\) Web site](#).

Print copies: Available from the American College of Foot and Ankle Surgeons, 515 Busse Highway, Park Ridge, IL 60068-3150; Web site: www.acfas.org.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available:

- Heel disorders and treatments (patient brochure). Park Ridge (IL): American College of Foot and Ankle Surgeons, 2001.

Electronic copies: Available from the [American College of Foot and Ankle Surgeons \(ACFAS\) Web site](#).

Print copies: Available from the American College of Foot and Ankle Surgeons, 515 Busse Highway, Park Ridge, IL 60068-3150; Web site: www.acfas.org.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This NGC summary was completed by ECRI on July 17, 2002. The information was verified by the guideline developer on July 7, 2003.

COPYRIGHT STATEMENT

Guidelines may not be reproduced without express written consent of the American College of Foot and Ankle Surgeons; phone: (800) 421-2237; Web site: www.acfas.org.

© 1998-2004 National Guideline Clearinghouse

Date Modified: 11/15/2004

